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THE AMERICAN JOURNAL
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OPHTHALMOLOGY

VOL. XXXIII. MAY, 1916. No. 5

ORIGINAL ARTICLES.

A CASE OF IMPLANTATION CYST OF THE IRIS.*

By Adolf Alt, M.D.
ST. LOUIS.

Cysts of the iris are of comparatively rare occurrence, a fact which is the more fortunate since the eyes in which such cysts have been observed were as a rule doomed to destruction. The number of cases which have been reported, since MacKenzie (1854) as the first described one, does probably not reach a hundred.

In most of these cases an injury, usually a perforating injury of the cornea had preceded the appearance of the cyst and had probably been its cause.

Lagrange in his large and excellent work on the tumors of the eye devotes a large chapter to the cysts of the iris, and divides them into four classes—pearl cysts, serous cysts, dermoid cysts and entozoic cysts.

The most recent classification of cysts of the iris is given by Parsons in his Pathology of the Eye. He divides them into: (1) implantation cysts, (2) retention cysts, (3) congenital cysts, (4) cysts of the retinal epithelium, and (5) parasitic cysts. To these he adds another form which he calls complex cysts.

Implantation cysts, also called pearl cysts, pearl tumors, epidermidomata, etc., have especially been observed after operations or accidental perforating injuries to the cornea, during which eyelashes or minute grafts of epithelial cells of the cornea, or the conjunctiva, or perhaps even of the epidermis of one of the eyelids, have been carried to and become implanted into the iris tissue. That such an accident can lead to the formation of

*Read in the May meeting of the St. Louis Ophthalmological Society.

this kind of iris cyst, and thus furnishes the most simple and natural explanation of their occurrence, has even been proven repeatedly by experiments by Dooremal, Goldzieher, Schweninger, and especially by Masse. In 1871 Rothmund collected 36 cases of iris cysts and found that in twenty-eight of these a perforating injury had preceded the cyst formation.

According to Monoyer such implantation cysts of the iris may be solid pearl tumors or real cysts. The pearl tumors according to his description consist of epithelial cells arranged in concentric lamellæ like the skins of an onion. Such tumors could then be likened in appearance to the so-called pearl nodules as we are accustomed to find them in epitheliomata.

In the real pearl cysts of the iris the cyst walls are formed by more or less distended iris tissue, the anterior wall being usually more atrophical than the posterior one. These walls are lined with a more or less regularly arranged epithelium, of which there are usually several layers. The contents of this cyst are usually made up of epithelial cells and shreds undergoing a retrogressive, mostly a fatty degeneration and may contain fat globules and cholesterin crystals.

Parsons brings under this head, furthermore, the so-called epithelial cysts of the anterior chamber which are in reality not what is usually meant by the designation cyst, and certainly not cysts of the iris. What has been given the name of epithelial cyst of the anterior chamber is produced when through a perforating accidental or operative wound of the cornea the corneal epithelium has grown between the wound lips to the posterior surface of the cornea and kept on growing until it forms a lining to the walls of the whole anterior chamber, including the anterior surface of the iris and such part of the anterior lens capsule as may be present in the area of the pupil if there is any pupillary area left.

Retention cysts, also called serous cysts, seem to be due more to inflammation or a non-perforating than to a perforating injury, although even this is doubted by some authors who hold that a foreign particle, if ever so minute, is necessary to arouse the activity in the iris tissue, which brings about the cyst formation. Some of such cysts had no sign of an epithelial lining of their very thin walls, others were lined with one layer of endothelial cells. Their origin, as has been maintained by Schmitt-Rimpler and afterwards by Treacher Collins, may be due to an assumed closure of one or more iris crypts with consequent

distention. Collins thinks that trabeculæ of iris tissue overlying the mouth of such crypts may swell and by becoming attached to the surrounding tissue lead to the formation of the cyst. This is the most plausible explanation, although proof for it is wanting. De Wecker thought such retention cysts might be due to the adhesion of larger folds of iris tissue to each other and that aqueous humor thus incarcerated formed the contents of the resulting cyst. However, this explanation does not seem very plausible, because no reason is apparent for such an adhesion of iris folds to each other when there was no preceding injury. What is to produce these folds in the iris if the eye is otherwise healthy, cannot well be understood. The same is the case with Eversbusch's explanation who assumed a detachment of the ligamentum pectinatum and a hæmorrhage into the iris tissue, unless a trauma has preceded. Hertel also gives this explanation.

Serous iris cysts which were of congenital origin have also been observed.

What have usually been termed congenital iris cysts are dermoid in character and therefore very much like implantation cysts. Yet, the absence of the prickle cells in the lining of implantation cysts makes these easily recognizable when compared with dermoid cysts which possess all the epithelial cells of the epidermis.

Cysts of the retinal epithelium should probably not be termed true cysts. In most cases, as also in the one Treacher Collins depicts, they are represented by a simple detachment of the retinal epithelial layer or layers from the posterior surface of the iris. Such detachments are infrequently found in injured and inflamed eyes where they appear to be due to adhesions of the posterior iris surface to the anterior lens capsule or to newly formed, mostly cyclitic tissue. Treacher Collins, who has raised such detachments to the dignity of real cysts, explained their origin by an interference with the lymph flow in the iris.

In one case which I have previously reported the several spaces due to such detachments of the retinal epithelium had undoubtedly contained blood and a considerable amount of cell proliferation had gone on in their walls.

Parasitic cyst of the iris seem to have been due to the presence of a cysticercus in the few cases observed.

The complex cysts of the iris which Parsons mentions are, too, not exactly cysts of the iris. In the few cases which have

been described by De Wecker, Knapp and myself there had been a perforating injury. In my case the periphery of the iris was in toto adherent to Descemet's membrane. In the transverse section the pupillary part of the iris was on one side grown together with a band of newly formed connective tissue reaching from the corneal scar back to the remnants of the lens where this band was firmly attached. On the other side the pupillary edge was also attached to the lens. Thus a space was formed which was enclosed between the cornea anteriorly, by newly formed tissue on one, iris tissue on the other side and a pupillary membrane attached to the lens posteriorly. The walls of this cavity were lined with several layers of endothelial cells, evidently derived from the endothelium of Descemet's membrane. It had the clinical appearance of an iris cyst, but in reality it was no iris cyst.

The eyeball which forms the subject of this paper I owe to the kindness of Dr. W. A. Shoemaker, of this city, who kindly furnished me the following short history of the case:

"R. G., aged 12, consulted me on January 15th,1914. He gave the following history: In October he cut his eye with a penknife and consulted one of my colleagues under whose care he has been until a few days ago.

"The condition of the eye was as follows: V=fingers at 3 feet; slight ciliary injection; tension normal; a central corneal scar extending vertically from limbus to limbus; an anterior synechia at the upper end of the scar; traumatic cataract; lens nearly absorbed; two hairs seen in the lower portion of the anterior chamber.

"Enucleation had been advised, but as the eye was not painful or sensitive, I advised against an immediate operation. Six months later he has no perception of light and some increased tension, but no pain or ciliary injection; no evidence of buphthalmus; the tension continued high, but caused no discomfort.

"At the end of another six months buphthalmus was well marked and slowly increased without any inflammatory symptoms until March 20th, 1916, when the eye was enucleated."

When the eyeball reached me in formol solution the corneal scar was plainly visible and showed several small bullæ. In the anterior chamber a round pearly gray tumor was seen, about the size of small grain of sago. It apparently sprang from the iris angle below and reached upward nearly to the pupillary edge.

Its middle seemed to be attached to the posterior surface of the cornea. Two eyelashes could be seen attached to the upper end of the corneal scar evidently with their thin ends. One, the thicker one, reached down and back into the region of the tumor and there was lost to view. The other and thinner one appeared to lie with its shaft across the iris surface. When the eyeball was cut in two the evidences of stretching and thinning out of the tissues in front of the ciliary body were plain, as, also, a deep excavation of the optic papilla. What was left of the lens formed a thin, membranous diaphragma.

The iris tumor, of course, attracted my special interest and I was especially desirous to obtain an unbroken series of microscopical sections of it for study. However, instead of being a solid tumor it proved to be a cystic one and, the contents being soft, its walls did not offer the necessary resistance to the cutting knife and thus the sections did not altogether fulfill my expectations. Only a part of them show the whole cyst wall unbroken and in its natural position. In others the wall is folded and therefore shows some parts on the flat. However, by that means the lining of the cyst wall can be studied to advantage.

The thick yellowish gray contents of the cyst invariably fell out of the sections. This in itself rendered it most probable that I had to deal with an implantation or pearl cyst of the iris.

The cyst itself lies to its whole extent in the iris tissue. Its anterior wall is considerably thinner than its posterior one, which is, however, also distended to some extent. The iris tissue thus divided into two unequal parts which form the cyst wall is lined on the inner surface throughout with several layers of epithelium. There is no basal membrane, the epithelial cells lying directly on the more or less conpressed iris tissue. The outermost layer consists of almost regularly arranged cells of a cuboid shape with a round nucleus. This is followed inward by a number of layers of flattened cells with an elongated nucleus and of more irregular shape. The nuclei of the innermost layer take up very little stain and are evidently being desquamated. The contents of the cyst consist altogether of layers of dead desquamated epithelial cells undergoing or having undergone a fatty degeneration and taking up no stain. They appear in consequence exactly like the contents of any sebaceous cyst. There is, then, no doubt but that this is an implantation cyst due to the grafting of epithelial cells, probably derived from one of the sebaceous glands lying at the root of the eyelashes having been

carried into the iris tissue when the injury occurred. Unfortunately I have not been able to find the bulb of one of the two lashes adherent to or actually fastened in the cyst wall. In a majority of the sections, however, a piece of eyelash is seen to lie on the anterior surface of the iris between the cyst and the iris periphery, which in some is plainly held more or less firmly in position by endothelial cells growing over it. In other sections it is actually buried superficially in the iris tissue. From this it does not seem impossible that even if the epithelial cells from the root of the eyelash or a sebaceous gland have not during the injury actually been driven into the iris tissue, they

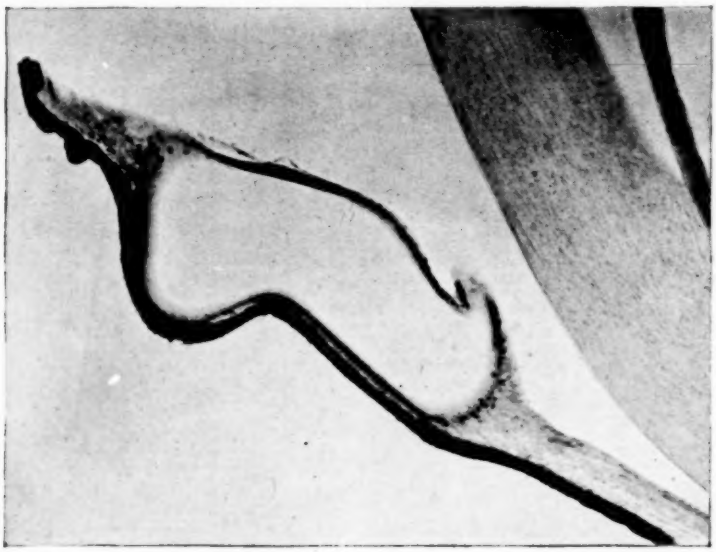

Fig. 1.

may when lying on the iris be grown over by the endothelial cells of the iris in such a manner that they are gradually buried in the iris tissue and may thus by proliferation give rise to the formation of a sebaceous cyst like the one in our case.

In the case here under consideration (see Fig. 1), the cyst did not as it appeared macroscopically start from the iris angle, but somewhat nearer the pupillary edge. It reached forward to within the region of the sphincter pupillæ. As it appeared macroscopically, it is firmly attached to Descemet's membrane at its thickest portion.

The part of the corneal scar in which the ends of the two eyelashes are embedded shows a peculiar condition in that the corneal tissue around the eyelashes is quite deeply pigmented to some extent. The anterior synechia which had been mentioned in the clinical history, I have been unable to find. But it is not possible to say for certain whether this pigmentation of the cornea is derived from the pigment of the lashes or whether it originated from some foreign material or uveal pigment having become attached to the wound lips during the injury, but it appears as if it had been furnished by the eyelashes.

A CASE OF QUININE AMBLYOPIA.*

By W. E. Shahan, M.D.,
ST. LOUIS, MO.

Owing to the increasing care with which drugs are being given at the present time, cases of quinine amblyopia are probably becoming increasingly rare. It is most likely to be found in cases where some error of dosage has been made or where more enthusiasm than wisdom is used in its administration. Such for instance as the popular use of quinine and whiskey for colds, etc., or of the use of quinine for the induction of abortion or as an aid in normal labor. A search through the literature will reveal a fairly large number of reports of such cases, and in all of them the symptom complex is practically identical; that is blindness frequently associated with deafness or ringing in the ears, and more or less contraction of the retinal blood vessels. Later, a sharp return of central vision with contracted fields and deficient color perception with, in some cases, optic atrophy. There is some difference of opinion as to the pathological basis of these symptoms. But probably first of all there is a marked contraction of the bloodvessels of the visual tracts, an endovasculitis and degeneration followed by more or less complete atrophy of the nerve fibres of the optic nerves, chasm and optic tracts as determined by de Schweinitz in his experiments on dogs. The drug appears to have a selective action on the optic tracts, the neighboring ciliary and oculo-motor nerves remaining normal.

The case I wish to report—a woman of 28—was referred to me by Dr. Hirschi. Dr. Hirschi had been called in after a midwife had failed to conduct her through her first parturition. A dead child was delivered. Next day, the patient was blind and deaf. Investigation showed that she had been given an ounce of quinine and an ounce of ergot in divided doses during 6 hours of labor. This was about 3⅜ grains per pound of the patient's weight. De Schweinitz showed in his experiments on dogs that 1 to 4 grains per pound produced blindness in 3 to 14 hours, and that 3 to 4 grains per pound was likely to produce death. This patient was cold and believed she was dying next day, which probably was near the truth.

I was called to see the case 18 days after the quinine was given.

*Read at the meeting of the St. Louis Ophthalmological Society April 24th, 1916.

At that time V=perception of 3½ volt pocket flash light at 5 inches R. & L. over a narrow region about the centre of the field. Pupils were somewhat elliptical in shape but responded promptly to light changes. She had a slight conjunctivitis for which a simple wash was given. The retinal vessels were very small, especially the arteries, some of which appeared to terminate abruptly at the disc margin. By close observation these could be followed further and appeared as fine silvery threads. She was put on inhalations of amyl nitrite in the hope of forcing the dilatation of retinal vessels. A month later her vision had increased to counting fingers at 8 ft. Five weeks later V=8/9 O.D., 8/15 O.S. Six weeks later she came to my office. Her vision then was 20/15 O.D., 20/60+ O.S. Retinal vessels small, discs pale. Investigation of color vision showed fairly good perception of red, some perception of colors near the red in the solar spectrum, but no discrimination whatever beyond the yellow. In other words it is a case of total blue-green blindness. At the present time, eight months later, V=20/15 O.D., 20/38 O.S. Fields much contracted. Patient is again pregnant. A remarkable feature at present is an apparent inability to read ordinary print although central V. O.D. is 20/15 and O.S. 20/38, and accommodation does not appear to be at fault.

The prognosis in quinine blindness is fairly good, for retention of central vision with permanently contracted fields and diminished color sense. Some cases, however, go to complete gray atrophy of the optic nerve and permanent blindness.

REMOVAL OF STEEL FROM LENS; NON-FORMATION OF CATARACT.*

By W. E. Shahan, M.D.,
ST. LOUIS, MO.

This patient was referred to me by his physician August 30th, 1915, for an injury to his right eye. Two days previously while hammering a copper rivet on a steel brake shoe, something struck him in the right eye. Sight was immediately bad. He used flax seed, bread and milk poultice, etc., two days, then consulted his family physician who brought him to me.

Eye was congested, pupil small, V=direction of motion of hand at 8 feet. Atropine produced good dilatation of the pupil after which a shining particle was visible buried in the lens somewhat to the temporal side of the center. There was a small linear wound of the cornea corresponding to this. After a little manipulation under cocaine 5 per cent. with a hand magnet, the particle came out of the lens and out of the eye through the original wound. The patient and his physician were told that there was a good chance for recovery of the eye but that cataract would likely occur later. Next day, eye quiet, V. 20/120 without glass. Four days later, some pain, V. 20/192, which seemed to indicate clouding of the lens although this was not visible. One week later V. 20/48+. Eight weeks later with +1.50 cyl. ax. vert. V. 20/15. Eight months later V. 20/15 O.D. Lens clear except at former site of foreign body where there is a linear scar in the anterior capsule and iris pigment and circumscribed clouding behind it. I have seen two other somewhat similar cases. In both these cases, however, the foreign body passed through the iris and periphery of the lens into the vitreous and was subsequently drawn out through an opening in the sclera by Dr. Ewing by means of a hard magnet. More than a year later the vision was 20/15+ in each case and the lens was clear except for a pigmented track where the steel passed through.

*Read at the meeting of the St. Louis Ophthalmological Society April 24th, 1916.

NIGHTBLINDNESS AS A WAR DISEASE.*

By Dr. M. Meyerhof,
HANNOVER.

A number of observations of nightblindness have been published during the present war which were made on soldiers in the field. The impossibility to find their way at night brought the men thus afflicted soon under medical treatment. Braunschweig[1] has in a short time had occasion to examine 27 such cases among widely different parts of the army; Zade[2] 12, Best[3] 36, and Paul[4] 16. All of these cases were seen at the scene of the war during the trench fights and especially in winter. Aside from errors of refraction, the eyes never showed any symptoms of disease; malnutrition was in most cases not to be thought of. Bitot's spots on the bulbar conjunctiva were always absent. A number of wounded officers with whom I had occasion to speak, affirmed that they had seen here and there cases of nightblindness among their men. All of these cases had occurred in the trenches and especially during the winter of 1914 to 1915. The moving war in the East, though fraught with much greater bodily strains and an often poor food supply on account of the bad roads and the rapid advance, seems to have brought about such cases of nightblindness but rarely. (Compare Uhthoff.)

It may be of interest to relate similar observations from the literature of the Napoleonic wars, although it is not possible to make at this late date a correct diagnosis.

When Bonaparte moved in 1798 with his just landed army from Alexandria to Cairo, his soldiers quite naturally suffered terribly from heat, thirst, sun blinding, and—in consequence of lack of foresight as regarded the poor supplies of the Nile land—from hunger. To this was added the tiring, severe service on night watches against the opposing bedouins and fellahin who sneaked forward without making a noise, so that, for instance, early on July 5th a severe night battle took place in the divisions of General Bon. On July 16th, four days previous to the battle

*Centrlbl. f. Prakt. Augenhlk., Jan., Feb., 1916.

1. Braunschweig. Kurze Mittheilung ueber die epidemische Hemeralopie im Felde. Muench. med. Wochenschr., 1915, No. 9, p. 303.
2. Zade. Ueber Augenerkrankungen im Felde. Ibidem, No. 23, S. 800.
3. Best. Ueber Nachtblindheit im Felde. Ibidem, No. 33, p. 1121.
4. Paul. Beobachtungen ueber Nachtblindheit im Felde. Ibidem, No. 45, p. 1548.

at the pyramids, Detroye,[5] chief of a battalion of engineers, wrote in his unpublished diary: "A number of soldiers have been attacked by an eye affection and cannot see by night." Since the serious inflammation of the eye, which later on ravaged the French army in such a terrible manner, began only in August, these were probably isolated cases of nightblindness. However, neither the chief surgeon Larrey,[6] nor the physician in chief Desgenettes[7] mentioned any such cases. It must be remembered that nightblindness is found even to-day epidemically among the badly nourished fellahin, especially the children, and particularly in certain regions of the Nile delta in which pellagra, too, is not rare on account of living on bad maize. I have not been able to find any other mention of nightblindness in any of the numerous writings on the campaigns, so full of deprivations, made by the French or English in Egypt and Syria.

On the other hand, Robert,[8] physician in chief of the military hospitals during the siege of Malta (1798 to 1800) gives a more accurate description of nightblindness which raged epidemically among the shut-in French troops.[9] In October, 1798, the blockade was completed by the English fleet. At the end of December scurvy was already rampant, so that in February, 1799, over 400, and in April 636, men suffered from it. Most of these patients complained at the same time of nightblindness. "The nyctalopia (sic)," says Robert, "is that form of eye disease in which patients cannot see at night. It is easy to recognize such patients; their pupils are large and considerably dilated. At night they cannot at all differentiate between objects. This disease attacks most frequently cachectic individuals with flabby tissues. . . . During the winter of 1798-99 (year VII) this disease was epidemic at Malta. The soldiers of Forts St. Angelo and St. Elmo suffered especially from it, while those of Fort La Florina remained perfectly free from it. The first named forts lie in the lowest part of the city, at the seashore, while the Florina lies highest and near the country. Cold moisture and

5. Cited by De la Jonquière, L'Expedition d'Egypt, 1798 to 1801.
6. D. J. Larrey. Relation historique et chirurgicale de l'expedition de l'Armée d'Orient. Paris, A. XI, 1803.
7. R. D. Desgenettes. Histoire médicale de l'Armée d'Orient. An. X, 1802.
8. Robert. Mémoire sur la topographie physique et médicale de Malte. An. XI, 1803.
9. Robert gives a special chapter to nightblindness, entitled "nyctalopia," while he had previously called the same affection "hémeralopie," which is the usual term nowadays. For the Hippokratics a nyctalops is a day blind; for Galen and the later authors the night blind.

night chills together with insufficient food are, therefore, the distant causes of nyctalopia; I especially mention the poor food, because the first cause alone could not have produced the nightblindness. There are frequent cold and moist winters at Malta and, yet, nightblindness had not occurred before. . . . At the same time when this nyctalopia appeared many individuals were attacked by diarrhœas or colds, others by discharges from and tearing of the eyes; those suffering in this way did not show nightblindness to the same extent. . . . The immediate cause of this disease is, therefore, an atonic condition, tiring and diminution of sensitiveness of the visual organ. Although the prognosis of this disease was free from any danger, still it caused considerable anxiety. Those afflicted by it could not stand guard on the walls of the forts by night. Fumigations of animals' livers and aromatic plants cured the disease. It reappeared, however, after a short time. During the whole time of the winter, as long as the conditions underlying it continued, it could not be cured; as soon, however, as the conditions of the soldier could be improved, and as soon as the cold and moisture had given way to the agreeable warmth of spring, the sensitiveness of the visual function returned and the disease disappeared." Soon thereafter the scurvy, also, disappeared by which 300 men had been affected. Although the siege lasted till September, 1800, that means through a second winter, Robert does not mention this disease any more.

This was probably a real epidemic nightblindness, as it used formerly to be quite frequent (mostly combined with xerosis conjunctivæ) in prisons, schools and among ships' crews[10] in consequence of the lack of green vegetables. Yet, it was not observed during other prolonged sieges in the 19th century (for instance at Hamburg, Sebastopol, Paris); as also at Port Arthur in 1904 and Przemysl, 1914-15.[11] It is notable that the nightblindness at Malta diminished when spring came and even disappeared. Braunschweig and Paul, too, saw their cases during winter. If exhaustion and undernutrition are to be accused, such reports of nightblindness should surely have been expected in the communications concerning the French campaign

10. Fr. Tyrrell (A practical Work on the Diseases of the Eye, Vol. II, London, 1840,) relates that it was particularly frequent on English ships in the ports of the East and West Indies and was called moonblindness by the sailors.
11. The regimental physician, Dr. R. Pamperl (Mediz. Klinik, 1915), says that scurvy, too, appeared only after the end of the siege among Austrian prisoners in the hospitals.

in Russia in 1812. There are, however, none from the relations of individuals having taken part in that campaign and none in the medical description of the Belgian military surgeon Von Kerckhove.[12] He mentions only a slight epidemic infection of the eyes at the beginning of the campaign and a severe ophthalmia during the retreat, a purulent discharge, which often led to blindness and was later on transmitted to the Prussian troops. Once (p. 168) he says, that many soldiers suffered from weakness of vision, even blindness, which was looked upon as "exhaustion of the irritability of the retina on account of the blinding snow." This was with probability in reality rather snowblindness than nightblindness. Larrey says occasionally (*Clinique Chirurgicale,* exercée particulièremant dans les camps et les hôpitaux militairs, etc. T. V. Paris, 1836) that during the Russian campaign of 1812 blindness from black cataract (gutta serena) occurred quite frequently.

Uhthoff[13] has recently stated that during the camgaign in Russia in 1914-15 he has seen very few cases of nightblindness, in spite of exhaustion and deprivations.

From all these communications it is impossible to get a definite knowledge of these cases of nightblindness, developed in the field. In the two cases which thus far I have observed it was caused by corneal opacities and astigmatism. On the other hand, I know from a reserve batallion that it has among its men several with congenital, probably hereditary, nightblindness which on account of this defect are unfit for guard and field duty. The hereditary nightblindness in the French family Nougaret was indeed detected by Cunier in 1838, because a soldier of this family had been found inattentive on guard duty, and had been wrongly punished. We must, therefore, assume with Best that there is no uniform cause for the cases of nightblindness, which have been observed in this war. A careful distinction of the cases according to his method and the observation of their curability will greatly improve our knowledge of this as yet enigmatical disease.

While these remarks were written, a paper by H. Feilchenfeld[13] appeared, who has seen nightblindness, usually among

12. Histoire des maladies observées á la Grande Armée francaise, pendant les campagnes de Russie en 1812 et d'Allemagne en 1813. Par le chevalier J. R. L. de Kerckhove dit de Kirchhoff. Troisième Edition, Anvers, 1836.

13. Sitzung der Med. Section der Schles. Ges. f. vaterlaend. Kultur, Nov. 19th, 1915; Med. Klinik, 1915, p. 1361.

miners, only associated with nystagmus and in diseases of the fundus. Sometimes it was simulated to escape work.

Professor Hirschberg drew my attention to the fact that in his book on "Aegypten" (Leipzig, 1890, p. 100), he has mentioned a report of the crusades which bears on our subject. It refers to the unhappy campaign of Johann von Brienne into Egypt and the capitulation of the crusaders at Damiette in 1221 A.D., related by Oliverius Scholasticus in Historia Damiatina (Eccard, Corpus historiæ medii aevi II, 1414): "Ex angustia famis diversa morborum genera vexabant cos et inter cetera incommoda quae sustinuerunt noctibus velut ærisia (aorasia) percussi apertis oculis nihil videre dicebuntur." Hirschberg adds that this was evidently nightblindness from lack of nutrition, and explains in a footnote the word aorasia as blindness as it is used in the septuaginta translation of the Bible.

OPTIC NERVE ATROPHY, HYPOPHYSIS AND RŒNTGEN RAYS.*

By Dr. A. Darier.

Atrophy of the optic nerve, this particularly inexorable form of blindness, is, luckily, far from being a well established morbid entity. Aside from the forms which are regarded as incurable (sclerosis tabetica, so-called essential atrophies, etc.) there are varieties of optic nerve lesions which are more or less amenable to our therapeutic efforts.

In the presence of evident symptoms of papillary atrophy, we must, therefore, try by all means in our power to determine as closely as possible all the different morbid modalities which may furnish us with a base for a treatment which may give us some chance to act on the cause or on certain symptoms of this terrible malady.

Some years ago I have been fortunate enough to be able to show that in certain optic nerve atrophies, following retrobulbar neuritis, we can obtain an arrest and then a notable retrocession of the morbid process by means of an intensive treatment by subconjunctival injections.

The visual field furnishes us with the most precious indications on the nature and the evolution of the process which causes the paleness of the papilla which led to the diagnosis of atrophy of the optic nerves.

How often has it not happened to me to give a comparatively favorable prognosis in cases whose vision had already fallen to 1/100, from the fact that the visual field which at first had seemed untakable had after a very careful examination shown that in reality there existed still a very peripheric light perception, and that the enormous loss of visual acuity was caused by a central scotoma of uncommon size which had led to the opinion that the visual field was totally abolished. The diagnosis of atrophy following retrobulbar neuritis was accompanied by a much less ominous prognosis, and a local and general treatment, judiciously applied, regained quite frequently a more or less good vision when, had the cause of the disease not been determined, the diagnosis of atrophy of the optic nerve might have led one to abstain from treatment and thus to permit the disease to continue its ravages.

*Clinique Ophtalmologique, March, 1916.

Another characteristic form of visual field with a prognosis less favorable than in other optic nerve atrophies is that of bitemporal hemianopsia, which almost always accompanies tumors of the hypophysis. It has been demonstrated for some years that the Rœntgen rays have a very marked dissolving power on newformations, and especially on sarcoma and adenomata, which are the two principal forms in which tumors of the hypophysis appear.

The first case in which I have been able to observe a favorable action of radiotherapy came to me in 1904 under the following circumstances.

Case I.—Mrs. D. had noticed the vision of the right eye failing rapidly and when closing the left eye she saw only half of her garden. In 1903 the left eye became affected also. A diagnosis of optic nerve atrophy, complete in the right and incomplete in the left eye, was made. All treatment was useless. I saw Mrs. D. in December, 1904. I found a very pronounced pallor of the papillæ, especially of the right one. The patient complained of an almost continuous headache characterized by a pronounced feeling of pressure in the frontal sinuses.

The examination of the visual fields presented the characteristic fact that the whole temporal side, starting from the median line, was completely absent. All colors including green were well recognized and V=1/3; in the other eye vision was absolutely abolished. This eye had been hemianopsic.

I recognized that this was no common atrophy, but rather the effect of a compression of the optic chiasm by some newformation, probably a tumor of the hypophysis.

A radiogram, very carefully made by Dr. Béclère, showed a considerable enlargement of the sella turcica. A series of Rœntgen ray applications were made and seemed to produce some benefit; the frontal pressure became less and for some time her vision did not grow less. Unfortunately this treatment was not continued and four years later her vision had fallen to 1/40. Lately I have heard that the lady has died totally blind.

This observation does not exactly prove anything regarding the curative action of the Rœntgen rays, which at that time was unknown, for since 1909 only conclusive observations on this subject have been gathered.

Case II.—M. W., 46 years of age, a metal worker, very tall and corpulent, with very large hands and feet; the face very full. He told me that since July, 1911, he noticed that he could

hardly read the newspaper and that in the following October it had become utterly impossible for him to distinguish the letters in the text. Only the large letters of the titles remained perceptible. The vision in the left eye was reduced to 1/10, in the right eye to 2/3. Yet, the papillæ showed no sign of atrophy. Measuring the field of vision disclosed a temporal scotoma, complete to the median line in the left eye and incomplete in the right eye, in which the sight was better. This made me think of a compression of the optic chiasm. This diagnosis was confirmed by a radiogram made by Dr. Béclère, who found a pronounced and characteristic enlargement of the sella turcica. Radiotherapy was begun on October 26th, 1911, and continued every week for six months; then the sessions were held at greater intervals, the last ones were held only once a month.

Two months after the commencement of this treatment the visual field became larger and the visual acuity in the left eye, which before the treatment was 1/10, rose to 1/3. In September, 1912, that is, after one year of treatment, the visual field was still larger.

This incontestable improvement in the ocular affection was combined with an improvement in the genital impotence complained of by the patient before the treatment. At the end of 1913 the vision has become almost equal in both eyes, with a very light scotoma in the left visual field. Since then the patient has resumed his regular occupations.

We are just now observing a third case which has come to us on October 15th, 1915, with a beginning atrophy of both optic nerves, in the left eye farther progressed than in the right, with bitemporal hemianopsia. R. E. V=1/2; L. E. V=1/10; all colors including green are well perceived. The patient is a woman of 42 years, very tall, with the facial traits very marked, and enormous hands and feet. For two years she has noticed that her sight had become much worse. In spite of large doses of potassium iodide the vision did not improve. At present she is under a radiotherapeutic treatment, administered by Dr. Béclère, since a radiogram showed a very great enlargement of the sella turcica. The result of this treatment will be reported later on.

* * * * * * * * * *

Nowadays the hypohysis has been shown to be an admirable regulator of the harmonious development of the most precious parts of the body, the bony skeleton and the reproductive function.

The knowledge of the disease was naturally followed by the search after its cure, by an action which disregarding the symptom would strike directly at the cause, and which in treating primarily the cause would make secondarily disappear the symptoms. This problem was made difficult by the deep seat of the hypophysis, surrounded by delicate organs and almost beyond reach. It did not seem easier to act on it so as to modify its state than to discover the pathologic states themselves, of course, early and before they had had the time to produce definite organic defects.

It developed on the ophthalmologist to evolve this precious symptom complex, this affirmation which would lead to an early diagnosis, and more which in giving the therapeutic indication would also regulate its application.

By its intimate relations with the chiasm of the optic nerve the hypophysis is placed at a point which the partial decussation of the nerves has gifted with particular properties, and which with an exquisite sensibility and with its pathognomonic symptoms will reveal the slightest modifications in the structure of the hypophysis. In his statistics Panora gives 45 per cent. adenosarcomata, 26 per cent. adenomata, 19 per cent. sarcomata and 3 per cent angiomata. This means 71 per cent. of neoplasms formed at the expense of the glandular parenchyma.

Treatment.—In the different hypophysial syndromes all sorts of treatments were employed during the long time in which the origin of the disease was unknown. Revulsives and topics accompanied by bleeding and purgatives were used in turn. The use of iron, iodine, arsenic, hot hydrotherapy led only to mistakes.

The discovery by Pierre-Marie and the new laboratory and surgical methods have ushered in a new era to therapeutics by furnishing a base; it did not see the symptoms only, it tried to act on the causal lesions in order to weaken their effects.

Very numerous studies have been made based on the theories of hypophysial physiology and of the pathogeny of its diseases; we have tried to combat the glandular inefficiency, to reduce its hyperfunction, finally to destroy the tumor itself as being the cause of trophic and mechanical disturbances.

In all cases in which the diagnosis of a tumor of the hypophysis has been made a complete examination of the cerebrospinal fluid and the Wassermann reaction should contribute to reveal the ætiology.

If hypophysial syphilis as such is actually very rare, we know how frequent on the contrary is gummatous meningitis at the base, and among the observations reported in literature several state a rapid improvement by antisyphilitic treatment.

If no improvement is seen, we must very quickly resort to other therapeusis.

By its deep location in a region difficult of access, on account of the vascular and nervous connections the hypophysis appeared to lie outside of surgical interference. Furthermore, the ways of reaching it with the greatest ease and causing the least disturbance have been multiplied.

One fact rests already on numerous observations: that is, the rapid and undeniable effect of hypophysectomy; but its results are clouded by the great mortality and the operative difficulties. Also, the great difficulty of an early diagnosis and of the exploration of the region in order to come to a conclusion as to the expansion of the tumor and its operability, "produce the fear that the rational surgery of the hypophysis will remain henceforth very rare in its indications and very doubtful as to its results."

In 1909 already Gramegna and then Béclère and Jaugeas reported improvements by Rœntgen rays in acromegaly.

This treatment is based on the action of the Rœntgen rays which when thrown in sufficient quantity on any tissue there destroy the living elements; and on the other hand, according to th dosage, destroy the complex tissues in proportion to their functional activity, especially their reproductive one. Malignant neoplasms disappear under a healthy skin which remains intact, the neighboring tissue being unaffected. The rays go, as if they were moved by a sure instinct, and find the pathological elements, and first stimulate its life in order to kill it the more certainly afterwards. More than all other tissue nerve tissue resists these radiations, thus permitting a prolonged and energetic therapeutic action and making it the selective method of treatment.

While it acts more or less strongly, according to this general law, called that of Bergonié and Tribondeau, influencing sarcomata quicker than epitheliomata, there is a tissue when its action is nil; that happens when a cystic degeneration has taken place. We know, and numerous autopsies have shown it, that this is just the frequent evolution in the case with which we are concerned; and this fact confirms the idea which we have mentioned at

the beginning of this paper, namely, the prime importance of an early diagnosis of these tumors by the ophthalmologist. Béclère has even proven that these tumors of the hypophysis after a period of hyperactivity pass through a period of hypoactivity during which radiotherapy is contraindicated and dangerous.

This treatment which has become more and more the treatment of choice encounters the same difficulties which have arrested the surgical method, the difficulty of access to the hypophysis. We know that the retrogression and improvement of the tumor depend on the histological structure, but are also proportional to the quantity of rays which reach it. This quantity is unknown; a portion is restrained by the different tissues which are interposed between the ampoule and the point to be reached; it will vary with the individuals and the absorbing power of their tissue. Measurements made on the cadaver cannot give a sure basis.

In this incertitude we must at the beginning strike hard since the researches of Clunet have shown that while in sufficient quantity the Rœntgen rays exert a destructive effect on the tumors, in a weak dose they increase their vitality. We will gain a result by employing the penetrating rays placed far enough from the skin and in order to equalize the quantities absorbed to use filtered rays. Dr. Jaugeas in taking up in his thesis the studies of his teacher Béclère has done remarkable work in this direction. We refer to this in all the following remarks.

The action of Rœntgen rays on tumors and especially its atrophying effect on glands in general is admitted by all; the very frequent observations of an improvement in the syndrome of Basedow, of cases of sterility after the irradiation of the testicle are proof sufficient. The adversaries of this method do not discuss the principle but only pretend that the technique employed does not permit of a sufficient action.

Let us see how hypophysectomy has affected the headaches, the visual and the trophic disturbances.

The headaches, which were violent and recurring in all these cases, disappeared very quickly, especially in the first case in which they receded after 8 days of treatment, and, except in this same observation, have never returned. Vomiting and vertigo followed the same course.

The ocular disturbances improved quickly and with an intensity which from the age of the affection had from the first seemed impossible.

The results of radiotherapy in tumor of the hypophysis are of the most favorable.

The first such observation was published in 1909 by Dr. Gramegna of Turino. He has published four further observations.

One of these cases presented herself with the following symptoms: Violent headaches with vertigo and vomiting, visual disturbances characterized by the contraction of the visual field, and almost absolute loss of vision on the right side; these are signs of compression; she had also, disturbances due to a poor function of the hypophysis, as gigantism and genital infantilism with adiposity.

Three other observations concern patients in whom the visual disturbances were predominant, and in these cases specialists have made the first examinations and sent the patients to the author. In these three cases we found hemianopsia, which at once turned our diagnosis toward the hypophysis. In one case there was a bitemporal hemianopsia which forced us to look for a lesion of the chiasm. The three patients presented a considerable and progressing loss of vision. The ophthalmoscope showed in one case a normal papilla, in another the papilla was pale with the appearance of descending degeneration of the optic nerve without neuritis. These patients, too, had headaches, but nothing outside of these pressure symptoms.

In the four cases the diagnosis as confirmed by radiograms of the head, in which the light spot corresponding to the hypophysis was three times as large as in the norm.

Under treatment the author said all these disturbances diminish. The headache disappeared, the visual symptoms improved, the bony overgrowth was arrested (but, of course, the bone lesions did not improve), the menses returned, the breasts developed, the pubic hair grew and a return of sexual power was noticed, the disappearance of enormous hunger, the adiposity, and still she gained in weight.

Having shown the results obtained, the author indicates the technique employed and its indications.

Technique.—The road which seems to be the most practical to irridiate the hypophysis is the buccal, because the rays have only to penerate the velum of the palate, the mucous membrane of the rhinopharynx and the body of the sphenoid bone which is very thin, moreover it contains the sphenoidal sinus. But it is necessary to pass the tube through the teeth and to maintain it in a

good place in the angle formed by the vault and the velum of the palate for some time; furthermore in the successive applications the same point of the buccal mucous membrane should always be iradiated.

The author, furthermore, prefers to direct the rays on the fronto-parietal region and to reach the hypophysis through the side of the cranium and the cerebral substance.

The application is very easy, for the cranial wall of the fronto-parietal region forms a segment of a sphere of which the hypophysis is the centre. It is, therefore, sufficient to put the localizator simply against this wall in order to direct the rays exactly on the hypophysis. The great advantage of this method is that it allows of a penetration of the rays through a multitude of different points since it suffices to use a localizator of a diameter of 3 cmm., which can be placed over the whole frontal region, over the anterior third of the parietal bone, over the whole scale of the temporal bone and over the anterior half of the great wings of the sphenoid bone.

The best place is the scale of the temporal bone where this bone in the skeleton is translucent.

There are no inconveniences because a filter of 1 mm. of aluminum permits only those rays to be employed which can penetrate bone, for the effects of the rays on the cerebral substance are in no way to be feared. The ampules must be very resistant and give only 3 H on every iradiated point.

The sittings are to be held once a week and must be continued for several months.

Indications and contraindications.—Treatment must be instituted as soon as the diagnosis has been made. There is no contraindication in patients who show signs of compression.

When there is *no symptom of compression* the radiotherapy has no place, except in the first stage of the affection. In the second period, which corresponds to the destruction of the gland, there is no longer any use in applying the Rœntgen rays. Clinically the passing over into this second stage is recognized by the arrest of the overgrowth of the bones, the loss of muscular force, somnolency, cerebral torpor, loss of hair, dryness of the skin and loss of weight.

Conclusions.—It is now established by recent and convincing observations that in certain tumors of the hypophysis methodical irradiations of this gland by means of Rœntgen rays have, in spite of the deep seat and the obstacles interposed, led to a re-

markable improvement in the symptoms, especially to at least a partial diminution of the ocular symptoms.

The happy results are explained by the elective sensibility of the glandular cells and the cells of the neoplasm to the destructive action of the Rœntgen rays.

Outside of cases of known syphilis, in which mercury is in place, the treatment of tumors of the hypophysis has only two rational indications, the removal and radiotherapy.

On account of the necessarily incomplete and purely palliative action of surgical treatment, the radiotherapy must always be preferred to it; it should at least always be tried at first.

In a general way, the radiotherapy of the tumors of the hypophysis will have the more chance for success, when applied with an irreproachable method and technique, if it is put in action at the earliest possible moment. This is the reason for the importance of an early diagnosis.

In the ophthalmic form it will only be possible to ameliorate the ocular symptoms when there is not yet any atrophy of the papilla optica.

In the gigantic and acromegalic forms it may arrest the evolution of the abnormal growth of the skeleton, but can, of course, not cause a diminution of the acquired lesions.

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MEDICAL SOCIETIES.

PROGRAM OF THE SECTION OF OPHTHALMOLOGY MEETING OF THE A. M. A.

June 12 to 16th.

Meets in Ball Room, Statler Hotel, Detroit.

Officers of Section.—Chairman, Walter R. Parker, Detroit; Vice-Chairman, Vard H. Hulen, San Francisco; Secretary, George S. Derby, Boston; Executive Committee, Hiram Woods, Baltimore; Frank C. Todd, Minneapolis; Edward C. Ellett, Memphis, Tenn.

Members are reminded that the meetings of the section will be called to order promptly on the hour scheduled for opening.

The formal reading of the papers will be omitted, as reprints of the papers on the program have already been delivered to members of the section.

Each essayist will be given ten minutes in which to summarize the points in his paper and introduce the discussion, and five minutes in which to close the discussion.

The member appointed to open the discussion of any paper will be allowed ten minutes. Subsequent speakers will be limited to five minutes.

The papers and all discussions will be printed and bound, forming the Transactions of the Section on Ophthalmology for 1916. Copies of the Transactions may be obtained at $1 each, if subscriptions are sent to *The Journal of the American Medical Association,* 535 North Dearborn Street, Chicago, by July 1, as only enough copies are printed to cover subscriptions received up to the time of going to press.

Members of the section are requested to register in the section registration book at the entrance. The full name and complete post office address should be written plainly.

Tuesday, June 13—2 p.m.

1. Chairman's Address.— Walter R. Parker, Detroit.
2. Syphilitic and Parasyphilitic Optic Nerve Affections. Physiologic Evidences in Favor of an Intracranial Treatment: Researches on Intravital Staining of the Optic Nerve.— Mark J. Schoenberg, New York.

Discussion to be opened by Udo J. Wile, Ann Arbor, Mich.

3. A Case of Granuloma Pyogenicum Affecting the Eyelid.—Cassius D. Wescott, Chicago.

Discussion to be opened by Lee Masten Francis, Buffalo.

4. A Study of Ophthalmoscopic Changes in Nephritis.—George Slocum, Ann Arbor, Mich.

Discussion to be opened by Albert E. Bulson, Jr., Fort Wayne, Ind.

5. The Uses of the Desiccation Method in Ophthalmology, with Special Reference to Epitheliomas of Lids, Canthi and Conjunctiva; Report of Cases (Lantern Demonstration).—William L. Clark, M.D., Philadelphia.

Discussion to be opened by S. Lewis Ziegler, Philadelphia.

Tuesday Evening, June 13.

There will be a moonlight water excursion together with the Section on Laryngology, Otology and Rhinology as guests of the Detroit Ophthalmological and Otologic Club and the Detroit Oto-Laryngological Society. Further information about this can be obtained from the local committee and at the opening session of the section.

Wednesday, June 14—9 a.m.

Exhibition of New Instruments and Appliances.

6. A New Instrument for the Clinical Measurement of Dark Adaptation.—Harry S. Gradle, Chicago.

7. The Fatigue of Accommodation as Registered by the Ergograph.—Lucien Howe, Buffalo.

Discussion to be opened by Hiram Woods, Baltimore.

8. A Primary Intradural Tumor of the Optic Nerve; Removal with Preservation of the Ball.—Edward C. Ellett, Memphis, Tenn.

Discussion to be opened by Edgar S. Thomson, New York.

9. Homatropin Glaucoma; Its Occurrence and Prevention.—Harold Gifford, Omaha.

Discussion to be opened by Eugene Smith, Detroit.

10. Traumatic Pulsating Exophthalmus.—William Zentmayer, Philadelphia.

Discussion to be opened by Frank E. Burch, St. Paul.

Wednesday, June 14—2 p.m.

11. The Etiology of Nonparalytic Ocular Imbalance: Some Original Conceptions and Interpretations Based on the Physiology and Psychology of Ocular Movements.—Will Walter, Chicago.

Discussion to be opened by G. C. Savage, Nashville, Tenn.

12. Heterophoria in Children—Wendell Reber, Philadelphia.

Discussion to be opened by Wilbur B. Marple, New York.

13. Strabismus Produced by Operations for Strabismus: A Consideration of Causes Producing Deformities Following Strabismus Operations, with Suggestions for Corrective Operative Procedure.—Frank C. Todd, Minneapolis.

Discussion to be opened by Harry W. Woodruff, Joliet, Ill.

14. A New Shortening Technic, with Report of Forty-Two Operations.—Roderic P. O'Connor, Oakland, Calif.

Discussion to be opened by William Campbell Posey, Philadelphia.

Thursday, June 15—9 a.m.

Election of Officers.

15. The Preparation of the Patient for Operation.—Walter B. Lancaster, Boston.

Discussion to be opened by William H. Wilder, Chicago.

16. Effects of Heat on the Eye.—William E. Shahan, St. Louis.

Discussion to be opened by Thomas B. Holloway, Philadelphia.

17. Progressive Macular Degeneration in Three Members of a Family.—Marcus Feingold, New Orleans.

Discussion to be opened by John E. Weeks, New York.

18. Thyroid Extract in the Treatment of Malignant Uveitis.—James Bordley, Jr., Baltimore.

Discussion to be opened by Nelson M. Black, Milwaukee, Wis.

Thursday, June 15—2 p.m.

19. A Comparative Study of the Fundus Oculi, Especially in Birds (Lantern Demonstration).—Casey A. Wood, Chicago.

20. Retinal Detachment in Hydrophthalmia.—Arnold Knapp, New York.

Discussion to be opened by Don M. Campbell, Detroit.

21. Discission of Crystalline Lens.—Edward Jackson, Denver.
Discussion to be opened by William E. Gamble, Chicago.
22. Preliminary Capsulotomy in Immature Cataract.—William Evans Bruner, Cleveland.
Discussion to be opened by Homer E. Smith, Norwich, N. Y.

ABSTRACTS FROM MEDICAL LITERATURE.

By W. F. Hardy, M.D.,
St. Louis, Mo.

A METHOD OF TREATMENT FOR CONJUNCTIVITIS.

Conscious humor has its place and is necessary in this gray and drab life. Unconscious humor is always welcome. Whether it is the former or latter permeating the article of Jefferson and Armstrong (*British Med. Jour,* March 4, 1916) is left to the reader to decide. It would appear, however, to be unconscious. A man is prone in ordinary talk to express himself in terms ordinarily used in his vocation. Soldiering at the present time seems to be a popular vocation. The authors being medical army officers have resorted to military metaphor. It is amusing to hear it creep into a scientific communication. The article has to do with the method of treating acute bacterial conjunctivitis cases at the front. Speedy recovery is the chief desideratum. Gonococcal, tuberculous and at times streptococcal infection can often be successfully treated by vaccines. The ordinary conjunctivitis is hardly susceptible to such treatment owing to the great variety of bacteria capable of setting up a conjunctivitis. Now comes a paragraph of military medical metaphor:

"The value of an antiseptic would appear to depend largely, if not altogether, upon the histological position of the invading bacterial army. When the bacteria are superficially disposed an antiseptic is the most obvious agent by which they may be destroyed. In this process the tissues themselves will suffer injury and death; but such cellular losses will be replaced from the practically illimitable resources of the body, while the super-

ficially placed bacteria have no such reserves to draw upon. When, however, bacteria have penetrated more deeply and have established for themselves in the tissue labyrinth bases where no antiseptic can reach, they can keep up a continuous stream of recruits which, in a war of antiseptic attrition, will be as proof against extermination as the cells of the organ they have invaded."

It has almost the familiar ring of an official report of a strategic Russian retreat. But to return to the subject matter: the authors state that ordinary antiseptics in conjunctivitis are more distinguished for their astringent than their bacterial properties. They therefore tried the effect of eusol solution for the following reasons: (1) It is a powerful antiseptic; (2) it seems strangely non-irritating to the tissues; (3) it has apparently already given good results in the hands of some reliable workers in the field of general surgery, but has not been used in the eye. A strength of solution one-tenth that used in treatment of ordinary wounds was employed at first; this was too weak, and double this strength was then used, giving the maximum effect. Every second case of conjunctivitis was treated by irrigating the conjunctival sac freely three times a day with eusol, the other cases were treated with boric acid and zinc sulphate solution. Cases of blepharitis, corneal ulceration, trichiasis, entropion and ectropion were excluded. One hundred cases were treated in this comparative manner. Of these the 50 treated with eusol took an aggregate time of 303 days, or an average of 6.06 days, to cure. The other 50 required 448 days, or an average of 8.96 days, to get the same result. The writers state that as a result of their work that it is apparent, apart from any gain in time, that eusol might yet be a very useful alternative measure for the treatment of conjunctivitis, for in six cases it succeeded in effecting a rapid cure of the disease where boric acid and zinc had proved unsatisfactory.

VISUAL DISTURBANCES OCCURRING IN PREGNANCY.

It is remarkable the persistence with which many medical men adhere to such terms as albuminuric retinitis and albuminuric retinitis of pregnancy. One would infer that the albuminuria was the cause of the trouble, whereas it is but a symptom which may or may not be present in the retinitis of nephritis and of preg-

nancy. Whether the changes characteristic of so-called toxæmic retinitis or retinitis of pregnancy represent a true retinitis or a degenerative phænomenon has always been a debatable question with the reviewer. As an indication that we are getting away from speaking of albuminuric retinitis, are the frequent references now made to "so-called albuminuric retinitis." An article in the *Penn. Med. Jour.*, March, 1916, by Curry, is a short discussion of the visual changes occurring in pregnancy with a recital of two clinical histories. It is a subject which might well receive more ophthalmological consideration than it does. The occasion may arise at any time to sit in judgment on the question of life and death of mother and unborn child or of the eyesight of a pregnant woman. There can hardly be a greater responsibility put upon a physician. Yet the subject receives but occasional notice. As the author states, visual disturbances occurring in pregnancy are not infrequent. The toxæmia of pregnancy may show itself as an amaurosis or sudden blindness without fundus change, whereas renal retinitis presents an almost typical ophthalmoscopic picture. Retinitis may exist for some weeks without vision being disturbed. Wilhelm and Weil are quoted as classifying visual disturbances in pregnant women in two forms, a dropsical and dry form. The former is due to the retention of chlorides, the latter to the retention of urea. In the dropsical variety, amaurosis is sudden with little or no structural change in the retina. With the elimination of chlorides the visual disturbances rapidly disappear. In renal retinitis there is retention of urea and marked structural changes in the retina. The gravity of the condition is accounted for by the coincident uræmia or azotæmia. The symptoms subside when the uterus is emptied. The ophthalmoscope affords a means of making an early diagnosis, and all pregnant women, with but a slight disturbance of vision of any kind whatsoever, should avail themselves of its help and advantages. This fact should be impressed upon all physicians. Once a neuroretinitis has set in, vision may be permanently damaged. A strong point made by Curry is that a toxæmia may exist without albuminuria, and retinal involvement may occur when the urinalyses are negative. If a toxæmia state is felt to be impending, appropriate eliminative measures may be taken. A kidney of pregnancy which might eventually develop into a chronic interstitial may be avoided as may even death itself. In the discussion of Curry's paper Burton Chance gave a very interesting talk. One paragraph deserves attention:

"The occurrence of retinitis in one pregnancy does not portend that the woman will be affected in subsequent pregnancies, although in them headaches may develop and albumin become present in the urine. So long as the fundi show no marked increase in the changes, the case is not grave. Choked disc with albuminuria has been observed to recur without apparent cause after delivery, and cases of moderate retinitis have been known to recur again and again, in the course of several pregnancies, the symptoms persisting until the child has been weaned. These may be considered to be due to a toxemia dependent upon the puerperal state."

GASTROINTESTINAL SYMPTOMS AND EYE STRAIN.

Much has been written in recent years relating to eye troubles and that terra incognita, autointoxication. Brav (*N. Y. Med. Jour.*, January 29, 1916) contributes an article concerning gastrointestinal symptoms and eye strain. He states it is not an easy matter to establish a definite causal relation in every case. We have been gently chaffed, and not without some reason, by the profession in other lines, for attributing everything, from alopecia areata to ingrown toe nail, to eyestrain. Brav includes a formidable array of symptoms arising from eyestrain, viz.. irritability of the stomach, loss of appetite, dyspeptic symptoms after the ingestion of food regardless of the nature of the food, dizziness, nausea and vomiting. He criticizes, however, the tendency to blame all ills of the body on autointoxication and urges that the primary causal element be sought and removed. If this be eyestrain the treatment is obvious. Headache with dizziness is a frequent complaint and is always aggravated by an overloaded stomach. Nausea as a result of some ocular disturbance is not an infrequent condition, being observed in many inflammatory ocular conditions such as iritis and glaucoma, but is also at times the result of errors of refraction and muscular imbalance. Vomiting in these cases may follow nausea. This may be the only symptom in cases of disturbance of the ocular balance that do not give rise to a manifest diplopia. Examination shows a latent diplopia. Persistent vomiting may be caused by errors of refraction, especially of the mixed astigmatism type. A case history is given to illustrate this point. Gastrointestinal symptoms of ocular origin are especially observed in children during the period of school life. In such cases the vomiting which is not pre-

ceded by a sense of fullness, epigastric pain or distress, eructation of gases, regurgitation of fluid, heart burn, fever and chills, is caused by an astigmatic error. Functional gastric disturbance is frequently caused by eyestrain. The minor astigmatic errors often produce the most annoying symptoms. The heterophorias, principally the vertical deviations, are especially prone to cause reflex symptoms. Gastrointestinal symptoms of ocular origin may be caused by

(1) Errors of refraction—simple, compound, mixed—astigmatism.

(2) Accommodative disturbances—spasm of ciliary muscles, paresis of ciliary muscles.

(3) Disturbances of motility—spasm of external ocular muscles, paralysis of external ocular muscles.

There are therapeutic problems in refraction. Refraction is a science; applied refraction is an art. Therefore judgment and painstaking care are required. In treating gastric symptoms from the ophthalmological point of view the oculist is at a disadvantage in complicated cases. His prescription for glasses, if they are going to give relief, must be correct when first prescribed, as a patient will not submit to frequent changes. The fact though that the first glasses ordered do not give relief in a given case is not conclusive proof that the symptoms are not ocular in nature and not infrequently another pair of lenses gives relief.